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Transactional associations among teacher support, peer social preference, and child externalizing behavior: A four-wave longitudinal study

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Abstract

The links between children's externalizing behaviors and two characteristics of children's social interactions within the classroom, namely peer social preference and received support from the teacher, were studied in 570 children followed from their second to third grade years of elementary school. Data consisting of peer and teacher reports of externalizing behavior, sociometric liked most and liked least nominations, and teacher rated support were available. Results showed consistent paths from externalizing behavior to (low) peer social preference. Peer social preference, in turn, predicted decreases in externalizing behavior, even after taking teacher support into account. Teacher support was not consistently linked to the development of externalizing behavior across time. However, an indirect path from externalizing behavior, via (low) peer social preference to lower levels of teacher support was found. These results were similar for girls and boys.

Keywords: externalizing behavior, peer social preference, teacher support, childhood

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Children with externalizing behavior are at increased risk for diverse problems in adolescence and adulthood, such as academic underachievement, school drop-out, mental disorders, substance abuse, violence, delinquency, and criminality (e.g., Dishion, French, & Patterson, 1995; Loeber & Hay, 1997; Moffitt, Caspi, Harrington, & Milne, 2002). Although externalizing behavior problems may have their origin in early childhood (Alink et al., 2006; Tremblay, 2003), a critical period in the behavioral development and successful socialization of children is in the elementary school period. With the transition to elementary school, the social domain in which children function expands, with new emerging interactions with teachers and peers (Bronfenbrenner & Morris, 1998; Ladd, 1990; Patterson, Reid, & Dishion, 1992). Participation in positive interactions with peers and teachers may offer children feelings of assistance or security, and thus, may facilitate adaptive behavior. On the other hand, problematic interactions, such as experiences of rejection by the peer group and negative interactions with teachers, may add to the development of behavioral problems (see Ladd, Birch, & Buhs, 1999).

Research has indeed revealed that interactions with peers (see Rubin, Bukowski, & Parker, 2006 for a review) and teachers (e.g, Davis, 2003; Doumen, Verschueren, Buyse, Germeijs, Luyckx, & Soenens, 2008; Mantzicopoulos, 2005; Sutherland & Oswald, 2005) coincide with the development of externalizing behavior. However, although both teachers and peers may influence children's externalizing problems within the same context, the school setting, studies with this aim generally focus on either the influence of peers *or* teachers. The purpose of this study is to explore the role of interactions with peers *and* teachers, in the development of externalizing behavior of children, while following them over their second and third grade years of elementary school.

Peer interactions and the development of externalizing behavior

With regard to peers, it is now well established that when children enter elementary school, classmates immediately start to evaluate their peers (see Dishion, Patterson, & Giesler, 1994; Dodge, Coie, & Brakke, 1982). As a consequence of this evaluation process, some children become liked and accepted by their classmates, whereas others are disliked or rejected (Boivin, Vitaro, & Poulin, 2005; Deater-Deckard, 2001; van Lier and Koot, 2008). When children are liked by few classmates, and disliked by the majority, these children have a low social preference, and are seen as actively rejected by peers (Coie, Dodge, & Coppotelli, 1982). Children with low social preference are likely to be deprived of contact with mainstream peers. As a result of the limited social interactions with mainstream peers, these children receive little social correction and guidelines for their behavior, which may facilitate, maintain, or exacerbate problem behavior over time (Deater-Deckard, 2001; Patterson et al., 1992; Schrepferman, Eby, Snyder, & Stropes, 2006).

Research has provided evidence for the links between low social preference (or peer rejection) and externalizing problems. For instance, it has been shown that low social preference/peer rejection can predict future aggression, delinquency, and other externalizing behaviors (e.g., Coie, Lochman, Terry, & Hyman, 1992; Coie, Terry, Lenox, Lochman, & Hyman, 1995; Ialongo, Vadan-Kiernan, & Kellam, 1998; Kupersmidt, Burchinal, & Patterson, 1995; Kupersmidt & Patterson, 1991; Miller-Johnson, Coie, Maumary-Gremaud, Bierman, & the Conduct Problems Prevention Research Group, 2002). Simultaneously, one of the best predictors of becoming rejected by peers is the externalizing problem behavior of the child (e.g., Boivin et al., 2005; Laird, Jordan, Dodge, Pettit, & Bates, 2001; Morrow, Hubbard, McAuliffe, Rubin, & Dearing, 2006; Pederson, Vitaro, Barker, & Borge, 2007; van Lier & Koot, 2008). Thus, the findings indicate a transactional relationship between externalizing behavior and social preference. That is, initial low social preference is frequently the consequence of early externalizing problems (Coie & Kupersmidt, 1983; Dodge, 1983), and experiences of low social preference, in turn, add to the development of

children's externalizing problems (Miller-Johnson et al., 2002; Vitaro, Pedersen, & Brendgen, 2007). Sturaro and colleagues directly tested this transactional relationship from ages 7 to 9 years old, using a 3-wave cross-lagged design. They showed that children's externalizing behavior consistently predicted low social preference the following year. The experiences of low social preference, in turn, added to the development of externalizing behavior. This supported the entanglement of peer social preference and externalizing behavior during early school-ages (Sturaro, van Lier, Cuijpers, & Koot, in press).

Teacher-child interactions and the development of externalizing behavior

Teachers' primary role in formal education is that of an instructor (Kesner, 2000). In addition, teachers function as caregivers, responsible for the physical and emotional well-being of their students in the absence of their parents (see Davis, 2003; Mantzicopoulos, 2005). Teachers may support a child by showing their appreciation and liking of the child, being attuned to the child's needs, spending time and energy on the child, and offering their availability when needed (Tucker et al., 2002; Wellborn, Connell, Skinner, & Pierson, 1992). Such expressions of support can assist children in adapting to school because of their emotional and motivational significance (see Baker, Grant, & Morlock, 2008). That is, children are more likely to feel competent and accepted and to internalize positive school-related values and behaviors when supportive teachers provide a warm and nurturing environment (Connell & Welborn, 1991; Deci & Ryan, 2000; Valeski & Stipek, 2001; Wentzel, 2002). Research with elementary school children has indeed shown that teacher support is negatively linked to children's externalizing behavior (e.g., Baker, 2006; Hughes, Cavell, & Jackson, 1999; Meehan, Hughes, & Cavell, 2003; Silver, Measelle, Armstrong, & Essex, 2005).

As found for the interactions with peers, maladaptive behavior may also undermine positive interactions with the teacher in the kindergarten and elementary school years (e.g., Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Ladd et al., 1999; Mercer &

DeRosier, 2008; Pace, Mullins, Beesley, Hill, & Carson, 1999). Thus, these findings regarding interactions with teachers also indicate a transactional relationship. Children's externalizing behavior can mitigate positive interactions with the teacher (low support), which may further amplify the child's externalizing behavior over time (Patterson et al., 1992; Sutherland & Oswald, 2005). The transactional relationship between teacher support and externalizing behavior has not been studied previously. However, Doumen and colleagues (2008) directly tested the transactional relationship between teacher-child conflict and children's behavior development. Their three-wave cross-lagged study showed that kindergartners' aggression at the beginning of the school year predicted mid-year teacher-child conflict, which in turn predicted kindergartners' aggression at the end of the school year.

Despite the existing research, an important gap in the literature is that the links between externalizing behavior and interactions with both peers and teachers are generally studied separately. Studies involving both social agents in the school context are scarce. Yet, elementary school children are confronted with both teachers and peers in the classroom, prompting the question about the uniqueness of the associations of interactions with peers *and* teachers with externalizing behavior. Several links can be hypothesized. First, both teachers and peers may independently exacerbate or reduce children's externalizing behavior (a unique influence model) (see Coie et al., 1993; Ladd & Burgess, 2001). For instance, in a study investigating classroom participation (e.g., tendency to accept the teacher's authority, comply with classroom rules), Ladd and colleagues (1999) found that both prior peer acceptance and teacher support (e.g., warm interactions with the teacher) independently and directly contributed to children's participation levels in kindergarten. However, peer acceptance did emerge as the most important predictor of classroom participation. A second option is a direct and indirect influence model in which one social factor (e.g., the interactions with the teacher) may shape the other social factor (the interaction with peers), which in turn affects the externalizing behavior development of the child (see Preacher & Hayes, 2004). In a cross-

sectional study, it was found that teacher support (i.e., teacher preference) mediated the statistical effect of child aggression on peer acceptance among children in first to fifth grade in Hong Kong elementary schools (Chang et al., 2007). However, peer acceptance as an intervening variable was not investigated. In a recent 4-wave longitudinal study, Mercer and DeRosier (2008) also shed some light on the nature of these indirect effects. They found reciprocal links between teacher preference and peer rejection (i.e., low peer social preference) over third and fourth grade, after controlling for children's aggression. Moreover, cross-time links were found from aggression to teacher preference and peer rejection, but not from teacher preference and peer rejection to aggression. Thus, their findings only indicated the presence of indirect effects from aggression to teacher preference over peer rejection, and from aggression to peer rejection over teacher preference. Based on these studies, the direct and indirect influence model may include – next to the direct effects - externalizing behavior influencing one social factor (e.g., teacher) through affecting the other social factor (e.g., peers). Indirect paths with externalizing behavior as the outcome have not been reported to date. To increase and fine-tune our understanding of the development of externalizing behavior and its relations with interactions with peers and teachers, we will study both models of influence proposed above.

When studying these relations the sex of the child will be taken into account. Research has consistently shown that boys, on average, engage in higher levels of externalizing behavior than girls (Moffitt, Caspi, Rutter, & Silva, 2001; Rutter, Caspi, & Moffit, 2003). Girls, on the other hand, are generally more accepted by peers than boys (e.g., Zimmer-Gembeck, Geiger, & Crick, 2005), and teachers frequently report being more supportive of girls than boys (e.g., Baker, 2006; Ladd et al., 1999). However, in addition to these level differences, some studies have shown sex to moderate the link between peer rejection and externalizing behavior, with concurrent negative links between peer rejection and externalizing behaviors being stronger for boys than for girls (Zimmer-Gembeck et al., 2005).

Findings concerning sex differences in the relationship between teacher support and externalizing are scarce. Sex differences in the relationship between negative teacher-child interactions (e.g., relational negativity; verbal abuse) and externalizing behavior (e.g., child disciplinary problems) indicate that the relationship is stronger for boys than for girls (Brendgen, Wanner, & Vitaro, 2006; Hamre & Pianta, 2001).

In sum, the aim of the present study is to explore links between interactions with peers and teachers, and children's externalizing behaviors across the second and third grade years of elementary school in a sample of 570 children from the general population living in Flanders (Belgium). Specifically, we will address whether interactions with peers and teachers have an independent link with externalizing behavior; or whether they are interrelated in their associations with the development of externalizing behavior, by examining the links between both social factors and externalizing behavior simultaneously. We hypothesize that children's externalizing behavior will predict low peer social preference and poor teacher support and that both in turn will directly add to children's externalizing behavior. Moreover, we expected to find reciprocal relations between teacher-child interactions and peer interactions. Together, these paths may produce indirect effects at least from externalizing behavior to poor teacher support, via low peer social preference and from externalizing behavior to low social preference, via teacher support. Finally, we will test for sex differences in the associations among externalizing problems, peer social preference, and teacher support.

Method

Sample

Fifteen schools participated in the study. All schools[1] were located in rural to moderately urban communities (populations ranged from about 9,000 to 90,000) in the Flemish community of Belgium (Algemene Directie Statistiek en Economische Informatie, 2004). Students were followed from the beginning of the second grade (September 2006) to the end of the third grade (June 2008). Each school had two second grade classes, making a

total of 30 classes. All children in these classrooms were eligible for inclusion. Written parental permission was obtained for 570 children (97% participation rate). Nearly half of the children (49.5 %) were boys. At the beginning of the second grade (wave 1), the children's mean age was 7 years and 5 months (*SD* = 4.6 months). The majority of the children and their parents were of Belgian nationality (>95%). Most parents completed higher education (63% of mothers, 57% of fathers). The remaining parents finished high school (28% of mothers, 30% of fathers), or completed primary school (9% of the mothers and 13% of the fathers).

Over the two year study period, classroom composition stayed intact. Only the teacher changed from the second to the third grade (which is usual in the Flemish educational system). Forty-one children were lost to follow-up because of grade retention, or because of moving away from school. These children had higher initial levels of teacher rated oppositional behavior, $t(568) = -5.34$, $p < .001$, and conduct problems, $t(568) = -5.92$, $p < .001$, as well as higher levels of peer rated aggression, $t(568) = -4.64$, $p < .001$, and oppositional behavior, $t(568) = -4.85$, $p < .001$. Additionally, at the beginning of the second grade, they had lower social preference scores, $t(568) = 4.31$, $p < .001$, and teachers reported to be less supportive of them, $t(568) = 4.18$, $p < .001$, compared with those children still participating in the study.

Procedure

Data were collected at four measurement waves, which included the fall and spring semesters during both the second and third grade years. At each wave, questionnaires regarding child behavior and teacher support toward the child were sent to the teacher, and collected after a few weeks. During the school hours, children were individually interviewed by one of the researchers with regard to the behavior and social preference of their classmates. Research was conducted in compliance with applicable institutional review boards, and parental consent was obtained from all participants. The participating children were not obliged to answer the questions during the interview and could refuse to participate.

Instruments

Children's externalizing behaviors were rated by their teacher and peers. Teacher ratings were obtained using the Problem Behavior at School Interview-Revised (PBSI-R; Erasmus Medical Center, 2000; see also Sturaro et al., in press). The conduct behavior (12 items, e.g., 'Tells lies', 'Curses or uses abusive words', 'Starts fights'; α = .91 at the first measurement wave) and oppositional behavior (7 items, e.g., 'Frequently talks back', 'Disobedient', 'Argues'; α = .92) subscales were used. Cronbach's alphas correspond to those reported in prior studies (e.g., Sturaro et al., in press; Witvliet, van Lier, Cuijpers, & Koot, 2009, 2010). Teachers were asked to answer the items on a 5-point scale from 0, referring to "never", to 4, referring to "often". The conduct behavior and oppositional behavior scales (r ranging from .79 to .84) were summed within each year to create an overall teacher rated externalizing behavior score (α = .95). This externalizing measure has been shown to be correlated (r = .75) with the broadband externalizing scales of Achenbach's Teacher's report Form (see Witvliet et al., 2010).

Peer-nominations of child externalizing behavior were obtained with two behavioral descriptions. Children nominated all the children in the classroom that met two descriptions of behavior (1) "Disobeys in school" (Oppositional problems), (2)"Sometimes hits children" (Aggression). Because peer nominations pool together the responses from all the classmates, peer nominations provide reliable data (Cole & White, 1993). The internal consistency (Kuder-Richardson Formula 20; KR-20) was .90 for Oppositional behavior and .85 for Aggression (see also Cillessen, 2009; Terry, 2000). Moreover, peer-nominated externalizing behavior has been found to correspond significantly with self-reported, teacher-rated, and parent-reported similar behavior (Epkins, 1995; Phillips, Lonigan, Driscoll, & Hooe, 2002). During the interview, it was ensured that each child understood the descriptions of the behaviors. The answering procedure was facilitated by a list of all the names of the children in the classroom. For each classroom member, the number of nominations per question was

added up and divided by the number of children in the classroom (minus 1; nominating oneself was not allowed). The oppositional behavior and aggression scores (*r* ranging from .73 to .79) were summed within each assessment to create an overall peer rated externalizing behavior score.

Teacher and peer reports on externalizing behavior were highly correlated (*r* ranging from .51 to .71). Therefore, the z-standardized teacher and peer scores were summed to create an overall externalizing problem behavior score.

Peer social preference was assessed by asking children to nominate all classmates (cf. Cillessen & Bukowski, 2000) that they liked most and liked least, using the protocol delineated by Coie and colleagues (1982). The total number of positive (LM) and negative nominations (LL) were divided by the number of children in the class (minus 1; nominating oneself was not allowed). Then social preference scores were computed by subtracting the LL from the LM scores. These social preference scores were used as indices of children's rejection among classroom peers. The lower the child's social preference score, the more the child was actively rejected by his/her classmates. Social preference is generally regarded as a reliable and valid measure of sociometoric status (Cillessen & Mayeux, 2004). The test-retest reliability of social preference between two following measurement waves ranged from .76 to .81, indicating a high stability, which is in accordance with a meta-analysis of the stability of this measure across 72 studies (Jiang and Cillessen, 2005).

Teacher support was assessed with the Involvement scale of the Teacher as Social Context questionnaire (TASC; Wellborn et al., 1992). The teacher rated 12 statements about his/her involvement toward each child separately on a 4-point-scale, with 0 being 'not at all true' and 3 being 'very true'. Involvement taps the teacher's affection, attunement, and dependability toward the child and the degree to which the teacher dedicates time and energy to the student (14 items, e.g., "I enjoy the time I spend with this student"; "I talk with this student"). A total score was calculated by averaging the positive and the reverse coded

negative items. The higher the score on involvement, the more the teacher reported to be involved with the child. Cronbach's alpha at the first wave was .84. There are indications that teachers' reports of their behaviors in the classroom reflect their actual behaviors or students' experiences of these (see Thijs, Koomen, van der Leij, 2008). For example, teacher reports of involvement have been shown to be correlated with students' perception of teacher involvement (Skinner & Belmont, 1993).

Results

Descriptive statistics

Means and standard deviations of externalizing behavior, social preference (SP), and teacher support for all four measurement waves are presented in Table 1. A series of repeated measures ANOVA's (analysis of variance) was run to test for differences between boys and girls on all main study variables. Compared to girls, boys had significantly higher levels of externalizing behavior ($F(1, 527) = 85.04$, $p < .001$), lower SP scores ($F(1, 525) = 20.30$, $p < .001$), and lower teacher support scores ($F(1, 527) = 8.63$, $p < .01$) over the four measurement waves. The bivariate Pearson correlations between all study variables are reported in Table 2. Significant cross-time stability was found for externalizing behavior and SP. Teacher support was especially stable within school year. In addition, significant concurrent and longitudinal correlations between externalizing behavior, SP, and teacher support (especially within school year) were observed.

Model fitting

The links between interactions with peers and teachers and externalizing behavior were tested using autoregressive cross-lagged models (Jöreskog, 1970, 1979). In autoregressive models, the outcomes of interest (e.g., externalizing behavior) are regressed on their immediate prior value. The autoregressive part thus models the continuity within outcomes. Concurrent and cross-lagged effects between outcome and parallel processes (e.g., externalizing behavior and SP) are also estimated. Significant cross-lagged effects indicate

that above and beyond stability within and concurrent links with externalizing behavior, SP has an additive effect on the manifestation of externalizing behavior. The data in this study were clustered within classrooms, implying that the estimation of the paths using ordinary least squares would underestimate the true variance of the estimate, leading to test statistics with inflated Type I errors. Therefore, robust standard errors (Williams, 2000) were used in all models, to correct for the clustering of data within classrooms. This method has been shown to adequately account for the structure of the data and research has shown that robust standard errors and multilevel analysis are equally adequate for precision estimates of group-level effects, when there are more than 20 clusters (in the present study there were 30 clusters or classrooms) (Arceneaux & Nickerson, 2009). A MLR estimator (maximum likelihood with robust standard errors) which produces robust standard errors was used also to control for possible non-normality of the data. Model fit was examined using the Root Mean Square Error of Approximation (RMSEA; values $\leq$ .08 reflect adequate to good fit; Browne & Cudeck, 1993), Comparative Fit Index (CFI; values $\geq$ .90; Bentler, 1990), and the Tucker Lewis Index (TLI; values $\geq$ .90; (Bentler, 1990). All structural models were run in Mplus version 4.1 (Muthén and Muthén, 1998-2009).

To test our hypotheses, we tested three nested (hierarchical) models. We started with fitting a model with only autoregressive paths, which was nested in the unique influence model, which in turn was nested in the direct and indirect influence model. The unique influence model was used to test our hypotheses on unique influences of both SP and teacher support on externalizing behavior development. The direct and indirect influence model was used to test whether above and beyond unique influences, the results supported our hypotheses on indirect effects between the studied variables.

The autoregressive model did allow concurrent correlations between externalizing behavior, SP, and teacher support (see Figure 1, top). Note that this model assumes only continuity within externalizing problems, SP, and teacher support, but not cross-time

influences between these three processes. This model had an acceptable fit to the data according to CFI (.94), and RMSEA (.07), but a below acceptable fit according to TLI (.89).

We then specified the unique influence model. Cross-lagged paths between SP and externalizing behavior and between teacher support and externalizing behavior were added (see Figure 1, middle). Note that this model assumes only unique links between externalizing behavior and SP or teacher support respectively. It does not allow cross-lagged paths between teacher support and SP. A chi-square different test (Satorra, 2000) was used to evaluate the significance of the improvement in fit when the cross-paths were added. Model fit improved significantly, $\Delta\chi^2$ (12, N = 570) = 27.61, p = .01. Model fit was acceptable, CFI = .96, TLI = .90, RMSEA = .06.

Finally, we fitted the direct and indirect influence model. In this model, we allowed both the direct paths between SP and externalizing behavior and teachers support and externalizing behavior, as well as paths between teacher support and SP. This model is depicted in Figure 1, bottom. Compared to the unique influence model, model fit was improved, $\Delta\chi^2$ (9, N = 570) = 34.27, p < .01. The fit of this final model further improved as compared to the unique influence model, CFI = .99, TLI = .95, RMSEA = .04. Given that this model fitted the data best, the results of this model only will be presented.

Externalizing behavior, social preference, and teacher support

The standardized estimates of the significant paths of the direct and indirect influence model are presented in Figure 2. It shows that externalizing behavior and SP were stable over time. Teacher support showed stability within school year. Above and beyond the stability paths, cross-lagged effects from SP to externalizing problems were consistently found. These cross-lagged effects were mirrored by paths from externalizing to SP, except for one path in third grade.

In contrast to SP, only one unique link between teacher support and children's externalizing behavior was found. Surprisingly, this path estimate yielded a positive

association. That is, higher levels of teacher support in second grade positively added to the development of externalizing problems at the beginning of third grade. No links from externalizing behavior to teacher support were found.

Finally, cross-lagged links between SP and teacher support were found as well. These paths were from SP at wave 1 and 2 to teacher support at wave 2 (β = .08, p = .04) and 3 (β = .31, p <.01), respectively. These paths yielded one potential indirect path from high externalizing behavior at wave 1 to low wave 3 teacher support via low wave 2 SP. We tested the significance of this indirect path, by estimating the joint significance of the two paths that comprise the indirect path (i.e., dividing the product of the two paths by its estimated standard error) (MacKinnon, Lockwood, Williams, 2004). The results showed that this indirect effect was significant (β = -.05, p < .01).

Sex differences

To test whether the magnitude of the associations between SP, teacher support, and children's externalizing behavior were similar for boys and girls, we specified a multiple group model (girls vs. boys). All paths were freely estimated for boys and girls. We then tested for significant differences in the cross-lagged paths across sexes using a Wald test. The unexpected positive path from wave 2 teacher support to externalizing behavior at wave 3 was only significant for boys, *Wald*(1) = 8.17, p < .01. Note that the correlations between these variables was not significant for boys (r = -.05, p = .46). No other significant sex differences in the magnitude of the cross-lagged associations between SP, support, and externalizing behavior were found.

Discussion

The aim of the present study was to explore the links among externalizing behavior and two social factors in the classroom, peer social preference and teacher support, during the second and third grade years of elementary school. Sex differences in the associations between externalizing behavior, peer social preference, and teacher support were examined as

well. The testing of nested models revealed that the model with direct and indirect paths between externalizing behavior, peer social preference, and teacher support had the best fit to the data, compared with the autoregressive only and the unique influence model. Evidence for independent links with externalizing behavior was only found for peer social preference. In addition, some evidence was found for the interrelatedness of the associations of peer social preference and teacher support with children's externalizing behavior. The direct and indirect influence model indicated that peer social preference played a key role in children's development, in that peer social preference uniquely added to the development of externalizing problems and (to a lesser extent) affected the support children received from the teacher. Moreover, although not consistent, peer social preference linked prior child externalizing behavior to teacher support. These findings were similar for boys and girls.

More specifically, the findings show that above and beyond stability within and concurrent relations between externalizing behavior and peer social preference, children's social preference scores appeared to predict lower externalizing behavior across all four measurement waves. In turn, externalizing behavior reduced children's social preference at all measurement waves with the exception of the last measurement wave. These results underscore previous studies using similar age periods, which revealed a transactional relationship between externalizing behavior and children's social preference (Ladd & Troop-Gordon, 2003; Sturaro et al., in press). Moreover, the present results extend these studies, in that it was shown that the relationship between externalizing behavior and peer social preference was independent of the influences of support from the teacher. This highlights the uniqueness of the relationship between peer social preference and externalizing behavior. Finally, the finding that externalizing behavior ceased to predict peer social preference in third grade may indicate the emergence of a peer reputation where evaluations of a child as likable or not turn into a stable reputation and gradually becomes independent of the child's prior behavior (see Denham & Holt, 1993).

In contrast to peer social preference, results regarding teacher support showed very few cross-time associations with externalizing behavior. Although teacher support was negatively associated to children's externalizing behavior concurrently, there was little evidence for an additive effect of teachers in (directly) predicting the development of externalizing behavior, nor was teacher support influenced by pre-existing externalizing behavior. These findings seem to indicate that teacher support is not uniquely related to children's externalizing behavior. Moreover, together with the findings concerning peer social preference, these results may reflect the relative importance of peer social preference and teacher support during the studied age period. Whereas support from the teacher is considered crucial during kindergarten (Pianta & Steinberg, 1992), our results suggest that teacher support may become of relatively less importance during middle childhood, at least for the development of externalizing behavior over time. In contrast, the consistent cross-time associations between peer social preference and externalizing behavior, highlight peer relations as a key factor for children's (behavioral) development during this age period. Indeed, in middle childhood, the frequency of interactions with peers and concerns about being accepted by the peer group greatly increases. In addition, the influence of the peer group becomes stronger, with deviancy training emerging (for a review see Rubin et al., 2006). It should be noted that replication of this study using other characteristics of teacher-child interactions is necessary to draw conclusions concerning the relative importance of interactions with teachers for externalizing behavior development compared to peer interactions.

The growing focus on peers during middle childhood is further underscored by the finding that peer social preference affected later teacher support and provided an indirect link between prior externalizing behavior and teacher support. With regard to the indirect effect, the results showed that children's externalizing behavior at the beginning of second grade influenced the support of the third grade teacher toward the child at wave 3, via the child's

social preference by peers at wave 2. Although these effects are not consistent, it can add to the importance of peer relations during this age period, in that peer social preference may be so influential that it not only effects children's behavior, but also interactions with other social agents in the classroom. Previous research has shown that when children are not accepted by their classmates, their classroom participation often decreases (e.g., Buhs & Ladd, 2001; Ladd, Kochenderfer, & Coleman, 1997; Ladd, Price, & Hart, 1990). The lack of classroom participation, in turn, can make the teacher feel incompetent or unliked by the child and, as a result, teachers might like the child less and prefer to spend less time with him/her (cf. Skinner & Belmont, 1993). Yet, previous studies have especially found empirical evidence for the effect of teacher-child interactions on peer interactions (e.g., Chang et al., 2007; Hughes & Kwok, 2006; Hughes, Zhang, & Hill, 2006; Tayler, 1989; White, Sherman, & Jones, 1996). However, these studies did not investigate the possible bi-directional nature of these effects. In a recent study, transactional links between teachers and peers were investigated in the third and fourth grade, and although, teachers and peers influenced each other over time, the contribution of peer social preference to teacher support was stronger than the opposite effect (Mercer & DeRosier, 2008). The researchers also attributed this finding to the increased importance of peer relations during middle school.

Finally, as expected, boys had higher levels of externalizing behavior and lower levels of social preference and teacher support than girls. These differences for girls and boys for the studied variables were found in previous studies as well (e.g., Baker, 2006; Moffit et al., 2001; Zimmer-Gembeck et al., 2005). Only one difference was found in the cross-lagged links where there was an unexpected and significant positive link between teacher support at the end of second grade and children's externalizing behavior at the beginning of third grade for boys only after controlling for prior externalizing behavior and peer social preference. However, the correlation between these variables was not significant for the total sample or for the boys. Thus, this effect was probably the result of suppression, in which one predictor

is not significantly correlated with the criterion, but receives a nonzero significant regression weight when controlling for another predictor (see *classical suppression* in Kline, 2005). Other sex differences were not found. Thus, despite the level differences between boys and girls found in this study and despite the difference in social worlds of boys and girls (see Maccoby, 1998; Schepferman et al., 2006), peer social preference seems to play a crucial role for the scholastic lives of both girls and boys during this age period. This finding adds to the limited amount of research examining sex differences in this domain (see Rubin et al., 2006).

Some limitations should be considered when interpreting these results. First, the age range did not allow us to examine the influence of social preference and teacher support on more severe behavioral problems, such as delinquency, substance use, or violence, as these severe behaviors are more likely to emerge at older ages (cf. Brendgen et al., 2006). Next, children with behavioral problems are at risk of rejection by their classmates (Deater-Deckard, 2001; Patterson et al., 1992) and frequently encounter more negative interaction with teachers (see Sutherland & Oswald, 2005; Stormont, 2002). Maybe including high-risk groups would provide more information on the role of teacher support and peer social preference for externalizing behavior. Furthermore, the children in the studied sample came from an 'advantaged' population, in that the majority of the parents were well-educated. This is important as research has shown that low socio-economic status (such as low parental education level) is linked to higher level of externalizing behavior (e.g., Morgan, Farkas, & Wu, 2009). Moreover, the sample was ethnically homogenous. Most of the children had a Flemish Belgian background. This may have affected the results as well since (low) teacher support has been found to be more strongly associated with declines in externalizing behavior among minority children in low-income urban environments (e.g., Meehan et al., 2003; Murray, Waas, & Murray, 2008) and children from nonminority, advantaged families are, on average, better accepted by classmates (Ladd et al., 1999). Studies with more socio-economically and ethnically diverse samples are needed before these findings can be

generalized to more diverse populations. Finally, some limitations pertain to the teacher-child interactions in this study. First, the transition from second to third grade involved changing teachers, while classroom composition stayed intact, which is a custom in Flemish schools. This may have inflated the influence of peer social preference, as compared to teacher support. Children generally pass through elementary school with the same peers, which may make them more vulnerable to negative peer relations as opposed to the level of support received from teachers who change from year to year. Therefore, caution should be taken when generalizing these results to schools in which teachers change less frequently or where classroom composition is less stable from year to year. Second, the studied characteristic of the type of interaction between teachers and children may also have explained the lack of consistent cross-time associations between teacher support and externalizing behavior. We examined teacher support (involvement) as a positively oriented aspect of teacher-child interactions, because previous research has demonstrated its relevance for the internalization of appropriate (i.e., non-externalizing) behaviors (see Deci & Ryan, 2000). However, in their review, Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) found that negative events consistently have a greater impact on the individual than positively valenced events of the same type over a broad range of psychological phenomena, including social relationships. Hence, this may also be the case for the teacher-child interactions examined in this study. Additionally, prior research has shown that negative aspects of teacher-child interactions such as teacher-child conflict (Doumen et al., 2008) and verbal abuse by the teacher (Brendgen et al., 2006) increased children's externalizing behavior over time. Furthermore, negative or stressful aspects of teacher-child interactions (e.g., conflict) were shown to be more salient for children's development of externalizing behavior than positive features (Baker, 2006; Ladd et al., 1999). Thus, the finding that the positive teacher-child interaction (i.e., involvement) does not affect children's externalizing behavior over time seems to be in line with these prior studies.

Implications for Research, Policy, and Practice

Despite these and other possible limitations, the present results provide new and valuable insights regarding the links between interactions with peers and teachers and children's externalizing behavior and have implications for future research and practice. Our results suggest that future studies should take multiple social agents into account when examining children's behavioral development. This may refine our knowledge concerning key components of children's behavioral development at different stages in life. Based on the finding that peer social preference is more central to the development of externalizing behavior when compared to teacher support in this age group, it is interesting to examine other related areas such as the influence of peers on externalizing behavior in relation to other characteristics of teacher-child interactions, such as teacher-child conflict, and in relation to other social agents, such as the parents. Furthermore, this study showed that peer social preference also affected the degree of teacher support provided to their students. This raises the question of how peer social preference and teacher support are related. It has been suggested that the link may be mediated by a third variable, such as classroom participation (cf. Hughes & Kwok, 2006; Skinner & Belmont, 1993). This may be an interesting focus for future research. Finally, the present findings may have some implications for practice. The present study provides substantial support for enhancing peer relations, and social preference, in particular, as a way to decrease children's externalizing behavior. Furthermore, enhancing children's relations with their peers may be a method to improve other social interactions, such as with their teachers.

References

Algemene Directie Statistiek en Economische Informatie (2004). *Bevolking en huishoudens. Huishoudens en familiekernen* [Population and households. Households and family nuclei]. Brussel, Belgium: Algemene Directie Statistiek en Economische Informatie.

Alink, L. R., Mesman, J., van Zeijl, J., Stolk, M. N., Juffer, F., Koot, H. M., et al. (2006). The early childhood aggression curve: Development of physical aggression in 10- to 50-month-old children. *Child Development, 77*, 954-966.

Arceneaux, K., & Nickerson, D. W. (2009). Modeling certainly with clustered data: A comparison of methods. *Political Analysis, 17,* 177-190.

Baker, J. A. (2006). Contributions of teacher-child relationship to positive school adjustment during elementary school. *Journal of School Psychology, 44*, 211-229.

Baker, J. A., Grant, S., & Morlock, L. (2008). The student-teacher relationship as a developmental context for children with internalizing or externalizing behavior problems. S*chool Psychology Quarterly, 23,* 3-15.

Barrish, H. H., Saunders, M., & Wolf, M. M. (1969). Good Behavior Game: Effects of individual contingencies for group consequences on disruptive behavior in a classroom. *Journal of Applied Behavior Analyses, 2*, 119-124.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D (2001). Bad is stronger than good. *Review of General Psychology, 5,* 323-370.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238-246.

Boivin, M., Vitaro, F., & Poulin, F. (2005). Peer relationships and the development of aggressive behavior in early childhood. In R. E. Tremblay, W. W. Hartup & J. Archer (Eds.), *Developmental origins of aggression* (pp. 376-397). New York: Guilford Press.

Brendgen, M., Wanner, B., & Vitaro, F. (2006).Verbal abuse by the teacher and child adjustment from kindergarten through grade 6. *Pediatrics, 117,* 1585-1598.

Bronfenbrenner, U., & Morris, P.A. (1998). The ecology of developmental processes. In W. Damon & R.M. Lerner (Eds.), *Handbook of child psychology: Vol. 1: Theoretical models of human development* (5th ed., pp. 993-1028). New York: Wiley.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newburry Park, CA: Sage.

Buhs, E. S., & Ladd, G. W. (2001). Peer rejection as antecedent of young children's school adjustment: An examination of mediating processes. *Developmental Psychology, 37*, 550-560.

Buyse, E., Verschueren, K., Doumen, S., Van Damme, J., & Maes, F. (2008). Classroom problem behavior and teacher-child relationships in kindergarten: The moderating role of classroom climate. *Journal of School Psychology, 46*, 367-391.

Chang, L., Liu, H., Fung, K. Y., Wang, Y., Wen, Z., Li, H., & Farver, J. (2007). The mediating and moderating effects of teacher preference on the relations between students' social behaviors and peer acceptance. *Merrill-Palmer Quarterly, 53*, 603-603.

Cillessen, A. H. N. (2009). Sociometric methods. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp 82-99). New York: The Guilford Press.

Cillessen, A. H. N., & Bukowski, W. M. (2000). *Recent advances in the measurement of acceptance and rejection in the peer system.* New York, NY: Jossey-Bass.

Cillessen, A. H. N., & Mayeux, L (2004). Sociometric status and peer group behavior: previous findings and current directions. in J. B. Kupersmidt & K. A. Dodge (Eds.), *Children's peer relations: From development to intervention* (pp. 3-20). Washington, DC: American Psychological Association.

Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology, 18*, 557-570.

Coie, J. D., & Kupersmidt J. D. (1983). A behavioral analysis of emerging social status in boys' groups. *Child Development, 54,* 1400-1416.

Coie, J. D., Lochman, J. E., Terry, R., & Hyman, C. (1992). Predicting early adolescent disorder from childhood aggression and peer rejection. *Journal of Consulting and Clinical Psychology, 60,* 786-792.

Coie, J. D., Terry, R., Lenox, K., Lochman, J., & Hyman, C. (1995). Childhood peer rejection and aggression as predictors of stable patterns of adolescent disorder. *Development and Psychopathology, 7*, 697-713.

Coie, J. D., Watt, N. F., West, S. G., Hawkins, J. D., Asarnow, J. R., Markman, H. J. et al. (1993). The science of prevention. A conceptual framework and some directions for a national research program. *American Psychologist, 48*, 1013-1022.

Cole, D. A., & White, K. (1993). Structure of peer impressions of children's competence: Validation of the peer nomination of multiple competencies. *Psychological Assessment, 5,* 449-456.

Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analyses of self-system processes. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self-processes in development: Minnesota Symposium on Child Psychology* (Vol. 23, pp. 43-77). Hillsdale, NJ: Erlbaum.

Epkins, C. C. (1995). Peer ratings of internalizing and externalizing problems in inpatients and elementary school children: Correspondence with parallel child self-report and teacher ratings. *Journal of Emotional and Behavioral Disorders, 3*, 203-213.

Erasmus Medical Center (2000). *Problem behavior at school interview.* Rotterdam, the Netherlands: Author.

Davis, H. A. (2003). Conceptualizing the role and influence of student-teacher relationships on children's social and cognitive development. *Educational Psychologist, 38*, 207-234.

Deater-Deckard, K. (2001). Annotation: Recent research examining the role of peer relationships in the development of psychopathology. *Journal of Child Psychology and Psychiatry, 42*, 565-579.

Deci, E. L. & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11,* 227-268.

Denham, S. A., & Holt, R. W. (1993). Preschoolers' likability as cause or consequence of their social behavior. *Developmental Psychology, 29,* 271-275.

Dishion, T. J., French, D. C., & Patterson, G. R. (1995). The development and ecology of antisocial behavior. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol. 2: Risk, disorders, and adaptation*. New York: John Wiley & Sons.

Dishion, T. J., Patterson, G. R., & Grielser, P. C. (1994). Peer adaptations in the development of antisocial behavior: A confluence model. In L. R. Huesmann (Ed.), *Aggressive Behavior: Currents Perspectives*. New York, NY: Plenum Press.

Dodge, K A (1983). Behavioral antecedents of peer social status. *Child Development, 54,* 1386-1399

Dodge, K. A., Coie, J. D., & Brakke, N. P. (1982). Behavior patterns of socially rejected and neglected preadolescents: The role of social approach and aggression. *Journal of Abnormal Child Psychology, 10*, 389-410.

Dolan, L. J., Turkkan, J. S., Werthamer-Larsson, L., & Kellam, S. G. (1989). *The Good Behavior Game manual.* City of Baltimore: Department of Education and the Prevention Centre, The John Hopkins University.

Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., Luyckx, K., & Soenens, B. (2008). Reciprocal relations between teacher-child conflict and externalizing behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology, 37,* 588-599.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*, 625-638.

Hughes, J. N., Cavell, T. A., & Jackson, T. (1999). Influence of the teacher-student relationship on childhood conduct problems: A prospective study. *Journal of Clinical Child Psychology, 28,* 173-184.

Hughes, J. N., & Kwok, O.-M. (2006). Classroom engagement mediates the effect of teacher-student support on elementary students' peer acceptance: A prospective analysis. *Journal of School Psychology, 43*, 465-480.

Hughes, J. N., & Zhang, D., & Hill, C. R. (2006). Peer assessment of normative and individual teacher-student support predict social acceptance and engagement among low-achieving children. *Journal of School Psychology, 43*, 447-463.

Ialongo, N. S., Vadan-Kiernan, N., & Kellam, S. (1998). Early peer rejection and aggression: Longitudinal relations with adolescent behavior. *Journal of Developmental and Physical Disabilities, 10*, 199-213.

Jiang, X. L., & Cillessen, A. H. N. (2005). Stability of continuous measures of sociometric status: A meta-analysis. *Developmental Review, 25*, 1-25.

Jöreskog, K. G. (1970). A general method for analysis of covariance structures. *Biometrika, 57*, 239-251.

Jöreskog, K. G. (1979). Statistical models and methods for analysis of longitudinal data. In K. G. Jöreskog & D. Sörbom (Eds.), *Advances in Factor Analysis and Structural Equation Models*. Cambridge, Mass: Abt.

Kesner, J.E. (2000). Teacher characteristics and the quality of the child-teacher relationships. *Journal of School Psychology, 38,* 133-149.

Kline, P. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY, Guilford Press.

Kupersmidt, J. B., Burchinal, M., & Patterson, C. J. (1995). Developmental patterns of childhood peer relations as predictors of externalizing behavior problems. *Development and Psychopathology, 7*, 825-834.

Kupersmidt, J. B., & Patterson, C. (1991). Childhood peer rejection, aggression, withdrawal, and perceived competence as predictors of self-reported behavioral problems in preadolescence . *Journal of Abnormal Child Psychology, 19*, 427-449

Ladd, G. W. (1990). Having friends, keeping friends, making friends, and being liked by peers in the classroom: Predictors of children's early school adjustment. *Child Development, 61*, 1081-1100.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*, 1373-1400.

Ladd, G. W., & Burgess, K. B. (2001). Do relational risks and protective factors moderate the linkages between childhood aggression and early psychological and school adjustment? *Child Development, 72*, 1579-1601.

Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1997). Classroom peer acceptance, friendship, and victimization: Distinct relational systems that contribute uniquely to children's school adjustment? *Child Development, 68*, 1181-1197.

Ladd, G. W., Price, J. M., & Hart, C. H. (1990). Preschoolers' behavioral orientations and patterns of peer contact: Predictive of peer status? In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 90-115). New York: Cambridge University Press.

Ladd G.W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development, 74*, 1344-1367.

Laird, R. D., Jordan, K. Y., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2001). Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems. *Development and Psychopathology, 13*, 337-254.

Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology, 48,* 371-410.

Maccoby, E. E. (1998). *The two sexes: Growing up apart, coming together*. Cambridge, MA: Belknap Press.

MacKinnon, D. P., Lockwood, C. M., Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research,* 39, 99-128.

Mantzicopoulos, P. (2005). Conflictual relationships between kindergarten children and their teachers: Associations with child and classroom context variables. *Journal of School Psychology, 43*, 425-442.

Meehan, B. T., Hughes, J. N., & Cavell, T. A. (2003). Teacher-student relationship as compensatory resources for aggressive children. *Child Development, 74*, 11458-1157.

Mercer, S. H., & DeRosier, M., E. (2008). Teacher, preference, peer rejection, and student aggression: A prospective study of transactional influence and independent contributions to emotional adjustment and grades. *Journal of School Psychology, 46,* 661-685.

Miller-Johnson, S., Coie, J. D., Maumary-Gremaud, A., & Bierman, K. (2002). Peer rejection and aggression and early starter models of conduct disorder. *Journal of Abnormal Child Psychology, 30*, 217-230.

Moffit, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescent-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology, 14*, 179-207.

Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex differences in antisocial behavior: Conduct disorder, delinquency, and violence in the Dunedin Longitudinal Study*. New York, NY: Cambridge University Press.

Morgan, P. L., Farkas, G., & Wu, Q. (2009). Kindergarten predictors of recurring externalizing and internalizing psychopathology in the third and fifth grades. *Journal of Emotional and Behavioral Disorders, 17*, 67-79.

Morrow, M. T., Hubbard, J. A., McAuliffe, M. D., Rubin, R. M., & Dearing, K. F. (2006). Childhood aggression, depressive symptoms, and peer rejection: The mediational model revisited. *International Journal of Behavioral Development, 30*, 240-248.

Murray, C., Waas, G. A., & Murray, K. M. (2008). Child race and gender as moderators of the association between teacher-child relationships and school adjustment. *Psychology in the School, 45*, 562-578.

Muthén, L. K., & Muthén, B. O. (1998-2009). *Mplus User's guide. Fourth Edition* Los Angeles, CA: Muthén & Muthén.

Pace, T. M., Mullins, L. L., Beesley, D., Hill, J. S., & Carson, K. (1999). The relationship between children's emotional and behavioral problems and the social responses from elementary school teachers. *Contemporary Educational Psychology, 24*, 140-155.

Patterson, G.R., Reid, J.B., & Dishion, T.J. (1992). *Antisocial boys* (Vol. 4). Eugene, OR: Castina Publishing Company.

Pedersen, S., Vitaro, F., & Borge, A. L. H. (2007). the timing of middle-childhood peer rejection and friendship: Linking early behavior to early-adolescent adjustment. *Child Development, 78*, 1037-1051.

Phillips, B. M., Lonigan, C. J., Driscoll, K., & Hooe, E. S. (2002). Positive and negative affectivity in children: A multitrait-multimethod investigation. *Journal of Clinical Child and Adolescent Psychology, 31*, 465-479.

Pianta, R.C., & Steinberg, M. (1992). Teacher-child relationships and the process of adjusting to school. In R.C. Pianta (Ed), *Beyond the parent: The role of the other adults in children's lives. New Directions for Child Development* (Vol.57, pp.61-80). San Francisco: Jossey-Bass.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, 36,* 717-731.

Rubin, K.H., Bukowski, W.A.M., & Parker, J.G. (2006). Peer interaction, relationships, and groups. In N. Eisenberg (Ed.), W. Damon, & R.M. Lerner (Series Eds.), *Handbook of Child Psychology, Vol. 3: Social, Emotional, and Personality Development* (6th ed. pp. 571-645). New York, NY: Wiley.

Rutter, M., Caspi, A., & Moffitt, T. E. (2003). Using sex differences in psychopathology to study causal mechanisms: Unifying issues and research strategies. *Journal of Child Psychology and Psychiatry, 44*, 1092-1115.

Sandstrom, M. J., & Cillessen, A. H. N. (2003). Sociometric status and children's peer experiences: use of the Daily Diary Method. *Merrill-Palmer Quarterly, 49*, 427-452.

Satorra, A. (2000). Scaled and Adjusted Restricted Tests in Multi-Sample Analysis of Moment Structures, in *Innovations in Multivariate Statistical Analysis: A Festschrift for Heinz Neudecker*, D. D. H. Heijmans, D. S. G. Pollock, & A. Satorra, (eds.), pp. 233-247, Kluwer Academic Publishers, Dordrecht.

Schrepferman, L.M., Eby, J., Snyder, J., & Stropes, J. (2006). Early affiliation and social engagement with peers: Prospective risk and protective factors for childhood depressive behaviors. *Journal of Emotional and Behavioral Disorders, 14*, 50-61.

Silver, R.B., Measelle, J.R., Armstrong, J.M., & Essex, M.J. (2005). Trajectories of classroom externalizing behavior: Contributions of child characteristics, family characteristics, and teacher-child relationship during school transition. *Journal of School Psychology, 43*, 39-60.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85,* 571-581.

Sturaro, C., van Lier, P. A. C., Cuijpers, P. & Koot, H. M. (in press). The role of peer-relationships in the development of early school-age externalizing problems. *Child Development*.

Stormont, M. (2002). Externalizing behavior problems in young children: Contributing factors and early intervention. *Psychology in the Schools, 39*, 127-138.

Sutherland, K., S., & Oswald, D, P. (2005). The relationship between teacher and student behavior in classrooms for students with emotional and behavioral disorders: Transactional processes. *Journal of Child and Family Studies, 4*, 1-14.

Taylor, A. R. (1989). Predictors of peer rejection in early elementary grads: Roles of problem behavior, academic achievement, and teacher preference. *Journal of Clinical Child Psychology, 18,* 360-365.

Terry, R. (2000). Recent advances in measurement theory and the use of sociometric techniques. In A. H. N. Cillessen & W. M. Bukowski (Eds.), *Recent advances in the measurement of acceptance and rejection in the peer system: New directions for child development* (Vol. 88, pp. 27-53). San Francisco: Jossey-Bass.

Thijs, J. T., Koomen, H. M. Y., van der Leij, A. (2008). teacher-child relationships and pedagogical practices: Considering the teacher's perspective. *School Psychology Review, 37*, 244-260.

Tremblay, R. E. (2003). Why socialization fails: The case of chronic physical aggression. In B. B. Lahey, T. E. Moffitt & A. Caspi (Eds.), *Causes of conduct disorder and juvenile delinquency* (pp. 182-224). New York: The Guilford Press.

Tucker, C. M., Zayco, R. A., Herman, K. C., Reinke, W. M., Trujillo, M., Carraway, K. et al. (2002). Teacher and child variables as predictors of academic engagement among low-income African American children. *Psychology in the Schools, 39*, 477-488.

Valeski, T. N., & Stipek, D. J. (2001). Young children's feelings about school. *Child Development, 72*, 1198-1213.

van Lier, P. A. C., & Koot, H. M. (2008). Peer relationships. In R. Loeber, W. N. Slot, P. Van der Laan & M. Hoeve (Eds.), *Tomorrow's criminals: The development of child delinquency and effective interventions*. Ashgate, England: Ashgate Press.

van Lier, P. A. C., Muthén, B. O., van der Sar, R. M., & Crijnen, A. A. M. (2004). Preventing disruptive behavior in elementary schoolchildren: Impact of a universal, classroom based intervention. *Journal of Consulting and Clinical Psychology, 72*, 467-478.

Vitaro, F., Pedersen, S., & Brendgen, M. (2007). Children's disruptiveness, peer rejection, friends' deviancy, and delinquent behaviors: A process-oriented approach. *Development and Psychopathology, 19*, 433-453.

Wellborn, J., Connell, J., Skinner, E., & Pierson, L. (1992). *Teacher as Social Context (TASC).* Rochester: University of Rochester.

Wentzel, K. R. (2002). Are effective teachers like good parents? Teaching styles and student adjustment in early adolescence. *Child Development, 73,* 287-301.

White, K. J., Sherman, M. D., & Jones, K. (1996). Children's perceptions of behavior problems in peers: Effects of teacher feedback and peer-reputed status. *Journal of School Psychology, 34*, 53-72.

Williams, R. L. (2000). A note on robust variance estimation for cluster-corrected data. *Biometrics, 56*, 645-646.

Witvliet, M., van Lier, P. A. C., Cuijpers, P., & Koot, H. M. (2009). Testing links between childhood positive peer relations and externalizing outcomes through a randomized controlled intervention study. Journal of Consulting and Clinical Psychology.

Witvliet, M., van Lier, P. A. C., Cuijpers, P. & Koot, H. M. (2010). Change and stability in childhood clique membership, isolation from cliques, and associated child characteristics. *Journal of Clinical Child and Adolescent Psychology, 39*, 12-24.

Zimmer-Gembeck, M. J., Geiger, T. C., & Crick, N. R. (2005). Relational and physical aggression, prosocial behavior, and peer relations. Gender moderation and bidirectional association. *Journal of Early Adolescence, 25*, 421-452.

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Footnotes

[1]Approximately half of the children in our study were randomly assigned to a preventive intervention program, the Good Behavior Game (GBG; Barrish, Saunders, & Wolf, 1969; Dolan, Turkkan, Werthamer-Larsson, & Kellam, 1989; Dutch version, see van Lier, Muthén, van der Sar, & Crijnen, 2004). Although studying intervention effects was not an objective of this study, we examined if attrition was related to the intervention status, which was not the case, $t(568) = -.44$, $p > .05$. Moreover, we tested whether the magnitude of the associations in the final model (direct and indirect effects model) were different between controls ($n = 283$) and intervention group children ($n = 287$), using a multi-group model. Controls served as the reference category. Only one path was different between control-group and intervention children. Specifically, the path from social preference (SP) at wave 3 to wave 4 externalizing behavior ($Wald(1) = 5.58$, $p = .02$) was only significant in the control group. Thus, very limited support was found for the presence of differences between intervention and control group in the links between SP, support, and externalizing behavior.

Figure Caption

Figure 1. Hypothesized models of associations between externalizing behavior, peer social preference, and teacher support from second to third grade.
Note. Model 1 denotes the autoregressive model. Model 2 denotes the unique influence model. Model 3 denotes a direct and indirect influence model. EXT = children's externalizing behavior. Peers = peer social preference. Teacher = teacher support.

Figure 2. Path estimates for the direct and indirect influence model of externalizing behavior, peer social preference, and teacher support. Only estimates significant at $p < .05$ or less are printed. Values on the single headed arrows reflect standardized regression estimates; values on the double headed arrows are correlations among residual variances of the variables. EXT = children's externalizing behavior. Peers = peer social preference. Teacher = teacher support. *$p < .05$. **$p < .01$. ***$p < .001$.

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